Quarterly Report

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METHODS FOR DETERMINING THE MECHANICAL COMPLIANCES OF CRACK TOUGHNESS TEST SPECIMENS

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An electrical extensometer of high sensitivity has been developed and is in the final stages of fabrication. Preliminary tests on the differential transformer section of this extensometer indicated a sensitivity of smaller than 5 micro-inches displacement can be detected. A voltage ratio circuit developed at NBS (described in NBS Technical Note No. 266) is being used to indicate the motion in the LVDT. A modification of the voltage ratio circuit is planned for additional sensitivity.

A load cell of 10,000 pounds capacity and an associated indicator has been calibrated. The calibration results indicate that it will be possible to determine the load within 0.05 percent of capacity load.

An improved procedure for attaching the extensometer to the test specimen has been developed and experiments will be run to check this method when the extensometer is completed.

Special end fixtures have been designed to study the effects of the load pins on the sheet specimen. This end fixture will make it possible to test combinations of the following load pin effects:

1. pin rigidly connected to the testing machine pull rods,
2. pin free to rotate on roller bearings with respect to the testing machine pull rods,
3. pin loosely fitted into the specimen hole, and
4. pin tightly fitted into the specimen hole.

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